INDEX OF VOLUME XX.

ARCHIBALD, R. C. Time as a Fourth Dimension, 409.

—— See REVIEWS, under Dingeldey, Ghersi, Koepp, Lietzmann, Schilling, Vivanti, Weber, Wiener.

BIRKHOFF, G. D. Note on the Gamma Function, 1.

BLISS, G. A. See REVIEWS, under Pierpont.

BÔCHER, M. The Infinite Regions of Various Geometries, 185.

BROUWER, L. E. J. Intuitionism and Formalism. Translated by A. DRESDEN, 81.

BROWN, E. W. See REVIEWS, under Abbe, Annuaire, Combebiac.

BUCK, T. Reports of Meetings of the San Francisco Section: Twenty-Fourth Regular Meeting, 176; Twenty-Fifth Regular Meeting, 518.

CARMICHAEL, R. D. Some Theorems on the Convergence of Series, 225.

—— See REVIEWS, under Young.

COLE, F. N. Reports of Meetings of the American Mathematical Society: October Meeting, 169; Twentieth Annual Meeting, 283; February Meeting, 395; April Meeting in New York, 507.

COWLEY, E. B. See REVIEWS, under Ciani, Meyer.

CURTISS, D. R. The Degree of a Cartesian Multiplier, 19.

DICKSON, L. E. On Binary Modular Groups and Their Invariants, 132.

—— See REVIEWS, under Arnoux, Hensel.

DOWLING, L. W. See REVIEWS, under Czuber.

DRESDEN, A. See BROUWER, L. E. J.

—— The Madison Colloquium, 115.

—— See REVIEWS, under Kowalewski.

EISENHART, L. P. See REVIEWS, under Christoffel.

EMCH, A. On Closed Continuous Curves, 27.

—— Two Convergency Proofs, 358.

—— See REVIEWS, under Bützberger, Study.

FINE, H. B. An Unpublished Theorem of Kronecker Respecting Numerical Equations, 339.

FRIZELL, A. B. A Non-Enumerable Well-Ordered Set, 404.

GLENN, O. E. A Translation Principle Connecting the Invariant Theory of Line Congruences with that of Plane n-Lines, 233.

GRONWALL, T. H. On the Summability of Fourier's Series, 139.

—— See REVIEWS, under Bolza, Hessenberg, Hilbert, Landau.

IRWIN, F. See REVIEWS, under Scheffers, Zoretti.

HAYASHI, T. On Ovals, 465.

HENNEL, C. B. See REVIEWS, under Hun, Murray, Tanner.

HURWITZ, W. A. Note on the Fredholm Determinant, 406.

KASNER, E. The Ratio of the Arc to the Chord of an Analytic Curve Need Not Approach Unity, 524.

KELLOGG, O. D. The Seventh Regular Meeting of the Southwestern Section, 180.

KENYON, A. M. See REVIEWS, under Carslaw.

LAVES, K. See REVIEWS, under Ziwet.

LIPKA, J. See REVIEWS, under Clebsch.

LONGLEY, W. R. See REVIEWS, under Webster.

LYTLE, E. B. See REVIEWS, under Evans.

MCKELVEY, J. V. See REVIEWS, under Sturm.

MANNING, W. A. On the Class of Doubly Transitive Groups, 468.

MILES, E. J. Some Properties of Space Curves Minimizing a Definite Integral with Discontinuous Integrand, 11.

MILLER, G. A. Some Properties of the Group of Isomorphisms of an Abelian Group, 364.

—— See REVIEWS, under Auerbach.

MITCHELL, H. H. On Some Systems of Collineation Groups, 134.

MOULTON, F. R. See REVIEWS, under Weyl.

PHILLIPS, H. B. See REVIEWS, under Czuber.

PONZER, E. W. See REVIEWS, under Ebner, Müller, F.

POWERS, R. E. A Mersenne Prime, 531.

RIETZ, H. L. See REVIEWS, under Bachelier.

ROWE, J. E. See REVIEWS, under Hawkes.

SHAW, J. B. See REVIEWS, under Padoa, Picard.

SKINNER, E. B. See REVIEWS, under Reid, Sommer.

SLAUGHT, H. E. Reports of Meetings of the American Mathematical Society: Twentieth Summer Meeting, 57; Winter Meeting at Chicago, 301; Spring Meeting at Chicago, 449.

SMITH, D. E. See REVIEWS, under Heath, Heiberg, Maennchen.

SMITH, P. F. See REVIEWS, under Norris.

SNYDER, V. The Vienna Meeting of the Deutsche Mathematiker-Vereinigung, 120.

—— See REVIEWS, under Church, Hauck, Loria, Low, Müller, E.

VAN VLECK, E. B. See REVIEWS, under Osgood.

WESTLUND, J. See REVIEWS, under Volterra.

WILCZYNSKI, E. J. See REVIEWS, under Darboux, Fischer.

WILSON, E. B. See REVIEWS, under Einstein, Fisher, Harris, Kelvin, Lebon, Love, Mercer, Moritz.

REVIEWS.

Abbe, C. The Mechanics of the Earth's Atmosphere. A Collection of Translations (third), E. W. BROWN, 435.

Allen, J. See Tanner, J. H.

Annuaire pour l'An 1914 publié par le Bureau des Longitudes, E. W. BROWN, 434.

Arnoux, G. Essai de Géométrie analytique modulaire à deux Dimensions, L. E. DICKSON, 96.

Auerbach, F., and Rothe, R. Taschenbuch für Mathematiker und Physiker, 3te Jahrgang, G. A. MILLER, 201.

Bachelier, L. Calcul des Probabilités, Tome 1, H. L. RIETZ, 268.

Bartlett, G. M. See Church, A. E.

Blaschke, W. See Study, E.

Bolza, O. Vorlesungen über Variationsrechnung, T. H. GRONWALL, 422.

Brown, H. G. See Fisher, I.

Bützberger, F. Über Bizentrische Polygone, Steinersche Kreis- und Kugelreihen und die Erfindung der Inversion, A. EMCH, 412.

Carslaw, H. S. An Introduction to the Infinitesimal Calculus—Notes for the Use of Science and Engineering Students (second edition), A. M. KENYON, 204.

Christoffel, E. B. Gesammelte mathematische Abhandlungen. Unter Mitwirkung von A. Krazer und G. Faber, L. P. EISENHART, 476.

Church, A. E., and Bartlett, G. M. Elements of Descriptive Geometry, V. SNYDER, 253.

Ciani, E. Lezioni di Geometria proiettiva ed analitica, E. B. COWLEY, 419.

Clebsch, A., and Lindemann, F. Vorlesungen über Geometrie (zweite Auflage), erster Band, erster Teil, erste und zweite Lieferungen, J. LIPKA, 381.

Combebiac, G. Les Actions à Distance, E. W. BROWN, 434.

Craigo, R. T. See Norris, E. B.

Czuber, E. Vorlesungen über Differential- und Integral-Rechnung (dritte Auflage), L. W. DOWLING, 418.

—— Wahrscheinlichkeitsrechnung (zweite Auflage), H. B. PHILLIPS, 429.

Darboux, G. Leçons sur les Systèmes orthogonaux et les Coordonnées curvilignes (deuxième édition), E. J. WILCZYNSKI, 247.

Dingeldey, F. Sammlung von Aufgaben zur Anwendung der Differential- und Integralrechnung, R. C. ARCHIBALD, 482.

Ebner, F. Technische Infinitesimalrechnung, E. W. PONZER, 158.

Einstein, A., and Grossmann, M. Entwurf einer verallgemeinerten Relativitätstheorie und einer Theorie der Gravitation, E. B. WILSON, 273.

Evans, G. W. The Teaching of High School Mathematics, E. B. LYTLE, 211.

Faber, G. See Christoffel, E. B.

Field, P. See Ziwet, A.

Fischer, P. B. Koordinatensysteme, E. J. WILCZYNSKI, 212.

Fisher, I., and Brown, H. G. The Purchasing Power of Money. Its Determination and Relation to Credit, Interest and Crises, E. B. WILSON, 377.

Ghersi, I. Matematica dilettevole e curiosa, R. C. ARCHIBALD, 238.

Grossmann, M. See Einstein, A.

Harris, F. Gravitation, E. B. WILSON, 328.

Hauck, G. Vorlesungen über darstellende Geometrie, erster Band, V. SNYDER, 253.

Hawkes, H. E. Higher Algebra, J. E. ROWE, 209.

Heath, T. L. Archimedes' Werke (Deutsch von F. Kliem), D. E. SMITH, 491.

Heiberg, J. L. Archimedis Opera Omnia. Vol. II, D. E. SMITH, 489.

Hensel, K. Zahlentheorie, L. E. DICKSON, 258.

Hessenberg, G. Transcendenz von e und π. Ein Beitrag zur höheren Mathematik vom elementaren Standpunkte aus, T. H. GRONWALL, 421.

Hilbert, D. Grundlagen der Geometrie (vierte Auflage), T. H. GRONWALL, 325.

—— Grundzüge einer allgemeinen Theorie der linearen Integralgleichungen, T. H. GRONWALL, 326.

Hann, J. G., and MacInnes, C. R. Elements of Plane and Spherical Trigonometry, C. B. HENNEL, 99.

Kelvin, Lord. Mathematical and Physical Papers. Vols. IV, V, VI, edited by Sir J. Larmor, E. B. WILSON, 431.

Kliem, F. See Heath, T. L.

Koepp, G. Illustrierter Spezialkatalog mathematischer Modelle und Apparate, R. C. ARCHIBALD, 244.

Kowalewski, G. Die komplexen Veränderlichen und ihre Funktionen, A. DRESDEN, 262.

Krazer, A. See Christoffel, E. B.

Landau, E. Handbuch der Lehre von der Verteilung der Primzahlen, T. H. GRONWALL, 368.

Larmor, J. See Kelvin, Lord.

Lebon, E. Gabriel Lippmann, E. B. WILSON, 326.

Levy, A. See Sommer, J.

Lietzmann, W., and Trier, V. Wo steckt der Fehler? Trugschlüsse und Schülerfehler, R. C. ARCHIBALD, 238.

Lindemann, F. See Clebsch, A.

—— and L. See Picard, E.

Loria, G. Poliedri, Curve e Superficie secondo i Metodi della Geometria descrittiva, V. SNYDER, 415.

—— Vorlesungen über darstellende Geometrie. Zweiter Teil: Anwendungen auf ebenflächige Gebilde, Kurven und Flächen (Deutsche Ausgabe von F. Schütte), V. SNYDER, 415.

Love, A. E. H. Some Problems of Geodynamics, E. B. WILSON, 432.

Low, D. A. Practical Geometry and Graphics, V. SNYDER, 253.

MacInnes, C. R. See Hun, J. G.

Maennchen, P. Geheimnisse der Rechenkünstler, D. E. Smith, 492.

Mercer, J. W. The Calculus for Beginners, E. B. Wilson, 30.

Meyer, W. F. Ueber die Theorie benachbarter Geraden und einen verallgemeinerten Krümmungsbegriff, E. B. Cowley, 324.

Moritz, R. E. College Mathematics Notebook, E. B. Wilson, 327.

—— College Engineering Notebook, E. B. Wilson, 327.

Müller, E. Lehrbuch der darstellenden Geometrie für technische Hochschulen, V. Snyder, 253.

Müller, F. Gedenktagebuch für Mathematiker (dritte Auflage), E. W. Ponzer, 157.

Murray, D. A. Elements of Plane Trigonometry, C. B. Hennel, 156.

Norris, E. B., and Craigo, R. T. Advanced Shop Mathematics, P. F. Smith, 428.

Osgood, W. F. Lehrbuch der Funktionentheorie (zweite Auflage), erster Band, E. B. Van Vleck, 532.

Padoa, A. La Logique déductive dans sa dernière Phase de Développement, J. B. Shaw, 97.

Picard, E. Das Wissen der Gegenwart in Mathematik und Naturwissenschaft. Deutsche Ausgabe von F. und L. Lindemann, J. B. Shaw, 424.

Pierpont, J. Theory of Functions of Real Variables, G. A. Bliss, 146.

Reid, L. W. The Elements of the Theory of Algebraic Numbers, E. B. Skinner, 147.

Rothe, R. See Auerbach, F.

Scheffers, G. Serret's Lehrbuch der Differential- und Integralrechnung (vierte und fünfte Auflage), zweiter Band, F. Irwin, 324.

Schilling, M. Catalog mathematischer Modelle für höheren mathematischen Unterricht, R. C. Archibald, 244.

Schütte, F. See Loria, G.

Serret, J. A. See Scheffers, G.

Sommer, J. Introduction à la Théorie des Nombres algébriques (French edition by A. Levy), E. B. Skinner, 202.

Study, E. Konforme Abbildung einfach-zusammenhängender Bereiche. Zweites Heft, herausgegeben unter Mitwirkung von W. Blaschke, A. Emch, 493.

Sturm, R. Maxima und Minima in der elementaren Geometrie, J. V. McKelvey, 427.

Tanner, J. H., and Allen, J. A Brief Course in Analytic Geometry, C. B. Hennel, 156.

Treutlein, P. See Wiener, H.

Trier, V. See Lietzmann, W.

Vivanti, G. Esercizi di Analisi infinitesimale, R. C. Archibald, 482.

Volterra, V. Leçons sur les Equations intégrales et les Equations intégro-différentielles, J. WESTLUND, 259.

Weber, H. Festschrift Heinrich Weber zu seinem siebzigsten Geburtstag am 5 März 1912, R. C. ARCHIBALD, 152.

Webster, A. G. The Dynamics of Particles and of Rigid, Elastic, and Fluid Bodies (second edition), W. R. LONGLEY, 159.

Weyl, H. Die Idee der Riemannschen Fläche, F. R. MOULTON, 384.

Wiener, H., and Treutlein, P. Abhandlungen zur Sammlung mathematischer Modelle, R. C. ARCHIBALD, 244.

—— Verzeichnis von H. Wieners und P. Treutleins Sammlung mathematischer Modelle für Hochschulen, höhere Lehranstalten und technische Fachschulen (zweite Ausgabe), R. C. ARCHIBALD, 244.

Young, J. W. A. Monographs on Topics of Modern Mathematics Relevant to the Elementary Field, R. D. CARMICHAEL, 207.

Ziwet, A., and Field, P. Introduction to Analytical Mechanics, K. LAVES, 37.

Zoretti, L. Leçons sur le Prolongement analytique, F. IRWIN, 321.

Index of Volume XX, 565.
New Publications, 51, 107, 164, 219, 276, 331, 389, 441, 499, 550.
Notes, 39, 100, 161, 213, 274, 329, 386, 437, 495, 546.
Papers Read before the Society and Subsequently Published, Twenty-Third Annual List of, 557.

NOTES AND OTHER ITEMS.

Academies, Associations, Congresses, and Societies:
American Mathematical Society: Administration, 58; Amendment of the Constitution, 284, 395; Annual Meeting, 100; Annual Register, 58; Colloquium Lectures, 170, 508; Election of Officers, 284; List of Officers and Members, 58, 213; New Members Admitted, 58, 169, 284, 395, 507; Presidential Address, 100, 284; Reports and Statistics, 284; Regular Meetings at Chicago, 170; Summer Meeting, 170, 508, 546; Transactions, 39, 58, 161, 213, 274, 437.
Associations for the Advancement of Science: American, 329; French, 547; Italian, 162.
Associations of Teachers of Mathematics: International Commission on the Teaching of Mathematics, 161, 274; Middle States and Maryland, 215; Ohio, 386.
Belgian Academy, 438; Circolo Matematico di Palermo, 386; Deutsche Mathematiker-Vereinigung, 547; Edinburgh Mathematical Society, 40, 162, 496; Encyclopedia of Mathematical Sciences, 329; Euler Society, 41; International Congress of Mathematicians, 40; Kasan Mathematical Society, 215; London Mathematical Society, 213, 274, 329, 386, 437, 547; Napier Tercentenary, 330; Paris Academy, 40, 275, 330; Scandinavian Congress of Mathematicians, 214; Swiss Mathematical Society, 214, 547.
Books, Announcement of New, 41, 215.
Catalogues of Books, Models, etc., 40, 216, 218, 388.
Doctorates in Mathematics, American, 41, 101.
Journals: American Journal of Mathematics, 39, 100, 329, 495; Annals of Mathematics, 100, 161, 437, 546; Proceedings of the Edinburgh Mathematical Society, 162; Transactions of the American Mathematical Society, 39, 58, 161, 213, 274, 437.

Papers and Communications Presented to the Society, Authors:

Alexander, J. W., II, 60.
Archibald, R. C., 509.
Baker, R. P., 61, 61, 451, 451.
Bateman, H., 396.
Bates, W. H., 305.
Bauer, G. N., 305, 305.
Beetle, R. D., 286, 396, 508.
Bell, E. T., 518, 518.
Bennett, A. A., 170, 170.
Bernstein, B. A., 177.
Bill, E. G., 508.
Birkhoff, G. D., 285, 508.
Blichfeldt, H. F., 61.
Bliss, G. A., 304, 304, 450.
Blumberg, H., 181, 181, 304, 304, 450.
Bôcher, M., 60, 508.
Bolza, O., 59.
Bouton, C. L., 285.
Boutroux, P., 285.
Brenke, W. C., 180.
Buchanan, D., 303, 303.
Burns, J. E., 59.
Bussey, W. H., 59.
Cajori, F., 60, 451.
Carmichael, R. D., 59, 59, 61, 450.
Carpenter, A. F., 518.
Chittenden, E. W., 451, 451.
Coble, 286, 508.
Conwell, G. M., 396.
Coolidge, J. L., 285.
Craig, C. F., 61, 396.
Cramblett, W. H., 286.
Cummings, L. D., 508.
Curtiss, D. R., 303.
Dickson, L. E., 115, 304, 304, 451.
Dines, L. L., 285.
Dodd, E. L., 60, 181.
Eells, W. C., 177.
Eisenhart, L. P., 286, 508.
Emch, A., 285, 303.
Evans, G. C., 59, 286.
Field, P., 304.
Fine, H. B., 285.
Fischer, C. A., 396.
Fréchet, M., 61.
Frizell, A. B., 304, 450.
Galajikian, H., 170, 286, 396.
Glenn, O. E., 60, 285.
Graustein, W. C., 286.
Graves, G. H., 170.
Green, G. M., 170, 170, 170, 286, 396.
Griffin, F. L., 518, 518.
Gronwall, T. H., 170, 286, 286, 286, 509.
Hart, W. L., 451.
Haskell, M. W., 177, 177.
Hazlett, O., 303.
H'Doubler, F. T., 59.
Hedrick, E. R., 59, 180, 181, 450.
Hildebrandt, T. H., 450.
Hoskins, L. M., 177.
Howland, L. A., 286.
Huntington, E. V., 285, 396.
Hurwitz, W. A., 285.
Ingold, L., 180.
Jackson, D., 60, 285, 396.
Joffe, S. A., 508.
Karpinski, L. C., 59, 303.
Kasner, E., 60, 170, 285.
Kellogg, O. D., 181.
Kells, L. M., 286.
Kempner, A. J., 181.
Kenyon, A. M., 451.
Kircher, E., 450.
Lamond, J. K., 286, 508.
Laves, K., 61.
Lefschetz, S., 180.
Longley, W. R., 286.
Love, C. E., 304.
Lytle, E. B., 59.
McKinney, T. E., 450.
MacMillan, W. D., 303, 303, 451, 451.
Manning, W. A., 177.
March, H. W., 61.
Marshall, W., 59.
Mason, T. E., 59, 450, 450, 451.
Miles, E. J., 509.
Miller, G. A., 177, 304, 304, 304, 450.
Mitchell, B. E., 396.
Mitchell, H. H., 508.
Moore, C. L. E., 508, 508.
Moore, C. N., 451.
Moore, E. H., 60.
Moore, R. L., 509.
Moritz, R. E., 518, 519.
Morrison, F. M., 518.
Moulton, E. J., 304.
Moulton, F. R., 304, 451.
Neikirk, L. I., 518.
Osgood, W. F., 60, 60, 115, 286.
Pell, A. J., 508.
Pitcher, A. D., 451.
Poor, V. C., 303.
Reddick, H. W., 286.
Richardson, R. G. D., 59.
Rider, P. R., 509.

Robinson, L. B., 285.
Roever, W. H., 171, 396.
Rowe, J. E., 60, 60, 508.
Running, T. R., 61.
Sanderson, M. L., 61.
Schweitzer, A. R., 60, 60, 60, 60, 181, 303, 304, 304, 396, 396, 450, 451, 451, 508.
Sharpe, F. R., 60, 61, 396, 396.
Shaw, J. B., 60, 304.
Sheffer, H. M., 61, 61.
Slobin, H. L., 305.
Smail, L. L., 518, 518.
Smith, W. M., 518.
Snyder, V., 285, 396.
Stouffer, E. B., 451.
Sullivan, C. T., 304.
Tappan, A. H., 285.
Tracey, J. I., 286.
Underhill, A. L., 304.
Vandiver, H. S., 395, 508.
Van Vleck, E. B., 59.
Wahlin, G. E., 305, 450.
Wear, L. E., 518.
Wedderburn, J. H. M., 286.
Weeks, E., 181.
Westfall, W. D. A., 59, 181, 450.
Wilczynski, E. J., 60, 304, 451.
Wilder, C. E., 509.
Williams, K. P., 304.
Wilson, E. B., 396.
Winger, R. M., 61, 61, 519.

Personal Notes:

Abraham, M., 48, 163; Albert O. W., 549; Allen, E. S., 50, 549; Altshiller, N., 163; Amoroso, L., 48; Anderegg, F., 49; Anderson, W. E., 49; Ansel, E. A., 440; Appell, P., 274; Armstrong, G. N., 105.

Bachelder, P. M., 49; Bagnera, G., 104; Baker, H. F., 213, 331; Ball, R. S., 218, 331; Barrow, D. F., 41; Barton, R. M., 50; Bateman, H., 42; Beal, W. O., 49; Beetle, R. D., 549; Behrens, W., 440; Bell, E. T., 42; Berliner, K., 217; Berndt, G., 440; Berry, A., 440; Bieberbach, L., 47, 104; Blaschke, W., 103; Blichfeldt, H. F., 49; Bliss, G. A., 49; Blumberg, H., 49; Bôcher, M., 163; Boehm, K., 216; Bordiga, G., 48; Borel, E., 162, 274; Bourlet, C., 106; Bouton, C. L., 498; Boutroux, P., 104; Bowley, A. L., 104; Brett, G. M., 217; Bromwich, T. J. I'a., 213; Brooks, C. E., 498; Brown, E. W., 275; Brown, G. L., 499; Brown, T. H., 49, 101; Burgess, R. W., 499; Burns, J. E., 42, 106; Burnside, W., 213.

Cajori, F., 105; Camp, B. H., 441; Cantor, G., 47; Carpenter, A. F., 163; Carscallen, G. E., 217; Chaney, G. A., 163; Chatelet, H., 104; Clarke, J. E., 218; Claude, A., 275; Clements, G. R., 42; Cobb, C. W., 42; Coit, W. A., 42; Colpitts, J., 163; Copeland, L. P., 42; Cowley, E. B., 275; Craig, C. F., 388; Cramblet, W. H., 42.

Daniele, E., 48; Darboux, G., 275; Darling, F. W., 106; Darwin, C. S., 498; Dehn, M., 47; Dickson, 58, 507; Dines, C. R., 49; Dines, L. L., 49, 498; Dodd, E. L., 498; Downey, J. F., 217; Drach, J., 104; Dumas, G., 48; Dumas, S., 48; Dutton, W. T., 441.

Eastman, J. R., 106; Edington, W. E., 217; Eells, W. C., 388.

Faber, G., 104, 216; Fehr, H., 214; Field, P., 217; Fine, H. B., 100, 105; Föppl, L., 440; Forsythe, C. H., 217; Fort, T., 217; Fréchet, M., 388; Fredholm, I., 104; Friessendorff, T., 50.

Gaba, M. G., 50; Gain, G. W., 499; Garnier, R., 104; Gautier, A., 547; Gavett, G. I., 163; Geiser, C. F., 48; Glaisher, J. W. L., 331; Gossard, H. C., 499; Grace, J. H., 213; Green, G. M., 42, 499; Gronwall, T. H., 441, 499; Guccia, G. B., 386; Guichard, C., 275; Gutzmer, A., 331.

Halsted, G. B., 388; Hardy, G. H., 440; Hart, H. F., 215; Haupt, O., 498; Hawkes, H. E., 215; Henoch, L., 217; Herr, G., 163; Hess, G. W., 50; Hilbert, D., 216; Hill, G. W., 104, 441; Hill, L. S., 499; Howland, L. A., 105; Hurwitz, A., 104; Hutchinson, J. I., 213.

Janiszewski, S., 498; Johnson, R. A., 42; Jones, W. M., 163.

Kasner, E., 275, 498; Kendall, F., 217; Keyser, C. J., 549; Kingston, H. R., 106; Kircher, E. A. T., 550; Klein, F., 41, 104, 216, 274; Knebelman, M. S., 105; Koenigsberger, L., 330, 331, 440; Kolacek, F., 218; König, J., 50; König, R., 440; Krathwohl, W. C., 105; Krazer, A., 330; Kuschke, C. G. P., 499.

Lackner, A., 440; Lamb, H., 216; Lapally, M., 163; Leblanc, M., 40, 275; Lefschetz, S., 105; Lennes, N. J., 49, 105; Lewis, F. P., 42; Libby, B., 217; Lilienthal, R. von, 331; Longley, W. R., 213; Loria, G., 104; Love, A. E. H., 213; Love, C. E., 42, 217.

McDonald, M., 106; McLaren, S. B., 48; Macfarlane, A., 106; Mackay, J. S., 441; Majcen, G., 216; Manning, W. A., 49; Marshall, W., 549; Mason, T. E., 549; Mathewson, L. C., 549; Mathies, W., 48; Messenger, H. J., 218; Miller, A. L., 275; Mills, C. N., 499; Mills, C. P., 217; Minchin, G. M., 441; Miser, W. L., 49; Molk, J., 40, 550; Moore, R. L., 213; Morris, R., 105; Moulton, E. J., 49; Moulton, F. R., 329; Mullins, G. W., 106.

Napier, J., 330; Northcott, J. A., 106.

Osgood, W. F., 549.

Pattengill, E. A., 163; Peirce, B. O., 275; Peirce, C. S. S., 441; Pell, A. J., 498; Perron, O., 330; Pettegrew, D. L., 331; Philip, M., 217; Plant, L. C., 105; Pockels, F., 218; Poincaré, H., 41, 275; Proell, A., 217; Putnam, T. M., 549.

Ranum, A., 213; Rasor, S. E., 105; Reynolds, F. G., 217; Reynolds, J. B., 105; Rietz, H. L., 217; Roberts, M., 163; Rockwood, C. G., 50; Rodenberg, G., 47; Root, R. E., 50; Roth, G., 106; Roth, P., 47; Rouse, L. J., 217; Rowe, J. E., 549; Running, T. R., 217; Rusch, F., 103; Russell, B., 217.

Sabine, W. C., 549; Sanderson, M. L., 42, 50; Saurel, P. L., 498; Sauvage, M., 275; Scorza, G., 48; Sheffer, H. M., 163; Shenton, W. F., 549; Simpson, C. G., 163; Slaught, H. E., 49; Slepian, J., 42, 499; Smail, L. L., 42, 163; Smith, D. M., 50; Smith, E. R., 215; Smith, P. F., 213; Smith, W. M., 49; Snedecor, G. W., 163; Stampy, D. L., 50; Steinitz, E., 47; Stone, R. B., 549; Stone, W. B., 105; Stone, W. H., 42; Störmer, C., 214; Stroobant, P., 330; Stuyvaert, M., 330; Sundman, K. F., 40.

Tappan, H., 549; Tarry, G., 106; Thaer, C., 47; Thompson, H. D., 441; Thomson, G. P., 549; Tietze, H., 104; Toeplitz, O., 331; Tonelli, L., 48.

Valentiner, H., 218; Van Vleck, E. B., 329, 498; Veblen, O., 105; Vogt, W., 440; Volterra, V., 216.

Wait, L. A., 50; Wear, L. E., 42, 163; Webber, W. P., 49; Weitzenböck, R., 47, 216; Wester, C. W., 217; Weyl, H., 48; White, H. S., 213, 329; White, J. G., 50; Whitney, A. W., 163; Whittemore, J. K., 388; Wilczynski, E. J., 440; Williams, K. P., 42; Winger, R. M., 49; Woodward, C. M., 331; Wright, H. N., 101.

Young, J. W., 549; Young, W. H., 104.

Zeis, H. C., 217.

Prizes:

Adams, 41; Belgian Academy, 438; Italian Academy of Sciences, 163; Kasan Mathematical Society, 215; King Gustav V of Sweden, 40; Paris Academy, 40, 275, 330; Sylvester Medal, 331.

Universities and Technical Schools:

Berlin, 45, 101, 438.
Bologna, 42.
Bonn, 45, 439.
Brunswick, 101.
Brussels, 548.
Cambridge, 386.
Catania, 43.
Chicago, 438.
Clausthal, 102.
Columbia, 496, 496.
Cornell, 496.
Dartmouth, 438.
Delft, 102.
Dresden, 102.
Genoa, 43.
Ghent, 548.
Göttingen, 46, 439.
Harvard, 497.
Illinois, 547.
Johns Hopkins, 547.
Karlsruhe, 102.
Leipzig, 46, 439.
Liège, 548.
Louvain, 548.
Mass. Institute, 103.
Munich, 46, 387.
Naples, 43.
Padua, 43.
Palermo, 44.
Paris, 162, 388.
Pavia, 44.
Pisa, 44.
Princeton, 497.
Rome, 44.
Strassburg, 47, 387.
Stuttgart, 103, 216.
Turin, 45.
Zurich, 103.

VOLUME XX., NUMBER 1

OCTOBER, 1913

Whole No. 221

CONTENTS

PAGE

Note on the Gamma Function By Professor G. D. BIRKHOFF - - - - - - - - - - - - 1

Some Properties of Space Curves Minimizing a Definite Integral with Discontinuous Integrand. By Dr. E J. MILES - - - - - - - - - - - - - 11

The Degree of a Cartesian Multiplier. By Professor D. R. CURTISS - - - - - - - - - - 19

On Closed Continuous Curves. By Professor ARNOLD EMCH 27

Let Us Have Our Calculus Early. By Professor E. B. WILSON - - - - - - - - - - - 30

Shorter Notice - - - - - - - - - - - 37

Notes - - - - - - - - - - - - - 39

New Publications - - - - - - - - - - 51

VOLUME XX., NUMBER 2

NOVEMBER, 1913

Whole No. 222

CONTENTS

PAGE

The Twentieth Summer Meeting of the American Mathematical Society. By Professor H. E. SLAUGHT - - - 57

Intuitionism and Formalism. By Dr. L. E. J. BROUWER. Translated by Professor ARNOLD DRESDEN - - - - 81

Shorter Notices - - - - - - - - - - - 96

Notes - - - - - - - - - - - - - 100

New Publications - - - - - - - - - - 107

VOLUME XX., NUMBER 3

DECEMBER, 1913

Whole No. 223

CONTENTS.

PAGE

The Madison Colloquium. By Professor ARNOLD DRESDEN 115

The Vienna Meeting of the Deutsche Mathematiker-Vereinigung. By Professor VIRGIL SNYDER - - - 120

On Binary Modular Groups and Their Invariants. By Professor L. E. DICKSON - - - - - - - - 132

On Some Systems of Collineation Groups. By Dr. H. H. MITCHELL - - - - - - - - - - 134

On the Summability of Fourier's Series. By Dr. T. H. GRONWALL - - - - - - - - - - 139

Note on Pierpont's Theory of Functions. By Professor G. A. BLISS - - - - - - - - - - 146

Reid's Theory of Algebraic Numbers. By Professor E. B. SKINNER - - - - - - - - - - 147

Heinrich Martin Weber. By Professor R. C. ARCHIBALD - 152

Shorter Notices - - - - - - - - - - 156

Notes - - - - - - - - - - - 161

New Publications - - - - - - - - - 164

VOLUME XX., NUMBER 4

JANUARY, 1914

Whole No. 224

CONTENTS

PAGE

The October Meeting of the American Mathematical Society. By Professor F. N. COLE - - - - - - 169

The Twenty-Fourth Regular Meeting of the San Francisco Section. By Dr. THOMAS BUCK - - - - - 176

The Seventh Regular Meeting of the Southwestern Section. By Professor O. D. KELLOGG - - - - - 180

The Infinite Regions of Various Geometries. By Professor MAXIME BÔCHER - - - - - - - - 185

Shorter Notices - - - - - - - - - - 201

Notes - - - - - - - - - - - 213

New Publications - - - - - - - - - 219

VOLUME XX., NUMBER 5

FEBRUARY, 1914

Whole No. 225

CONTENTS

PAGE

Some Theorems on the Convergence of Series. By Professor R. D. CARMICHAEL - - - - - - - - - 225

A Translation Principle Connecting the Invariant Theory of Line Congruences with that of Plane n-Lines. By Professor O. E. GLENN - - - - - - - - - 233

Some Mathematical Booklet Series. By Professor R. C. ARCHIBALD - - - - - - - - - - 238

Mathematical Models. By Professor R. C. ARCHIBALD - 244

Differential Geometry. By Professor E. J. WILCZYNSKI - 247

Descriptive Geometry. By Professor VIRGIL SNYDER - 253

Shorter Notices - - - - - - - - - - - 258

Notes - - - - - - - - - - - - 274

New Publications - - - - - - - - - 276

VOLUME XX., NUMBER 6

MARCH, 1914

Whole No. 226

CONTENTS

PAGE

The Twentieth Annual Meeting of the American Mathematical Society. By Professor F. N. COLE - - - 283

Winter Meeting of the Society at Chicago. By Professor H. E. SLAUGHT - - - - - - - - - - 301

Shorter Notices - - - - - - - - - - 321

Notes - - - - - - - - - - - - 329

New Publications - - - - - - - - - 331

VOLUME XX., NUMBER 7

APRIL, 1914

Whole No. 227

CONTENTS

PAGE

An Unpublished Theorem of Kronecker Respecting Numerical Equations. Presidential Address. By Professor H. B. FINE - - - - - - - - - - 339

Two Convergency Proofs. By Professor ARNOLD EMCH - 358

Some Properties of the Group of Isomorphisms of an Abelian Group. By Professor G. A. MILLER - - 364

Theory of Prime Numbers. By Dr. T. H. GRONWALL - 368

The Price Level. By Professor E. B. WILSON - - 377

Shorter Notices - - - - - - - - - - 381

Notes - - - - - - - - - - - - - 386

New Publications - - - - - - - - - 389

VOLUME XX., NUMBER 8

MAY, 1914

Whole No. 228

CONTENTS

PAGE

The February Meeting of the American Mathematical Society. By Professor F. N. COLE - - - - - - - 395

A Non-Enumerable Well-Ordered Set. By Professor A. B. FRIZELL - - - - - - - - - - 404

Note on the Fredholm Determinant By Dr. W. A. HURWITZ - - - - - - - - - - - 406

Time as a Fourth Dimension. By Professor R. C. ARCHIBALD - - - - - - - - - - - 409

The Discovery of Inversion. By Professor ARNOLD EMCH 412

Shorter Notices - - - - - - - - - - 415

Notes - - - - - - - - - - - - - 437

New Publications - - - - - - - - - 441

VOLUME XX., NUMBER 9

JUNE, 1914

Whole No. 229

CONTENTS

PAGE

Spring Meeting of the Society at Chicago. By Professor H. E SLAUGHT - - - - - - - - - 449

On Ovals. By Professor TSURUICHI HAYASHI - - - 465

On the Class of Doubly Transitive Groups. By Professor W A. MANNING - - - - - - - - 468

Christoffel's Mathematical Works. By Professor L. P. EISENHART - - - - - - - - - - 476

Problem Collections in Calculus. By Professor R. C. ARCHIBALD - - - - - - - - - - 482

Shorter Notices - - - - - - - - - - 489

Notes - - - - - - - - - - - - 495

New Publications - - - - - - - - - 499

VOLUME XX., NUMBER 10

JULY, 1914

Whole No. 230

CONTENTS.

PAGE

The April Meeting of the American Mathematical Society in New York. By Professor F. N. COLE - - - 507

The Twenty-Fifth Regular Meeting of the San Francisco Section. By Dr. THOMAS BUCK - - - - - 518

The Ratio of the Arc to the Chord of an Analytic Curve need not Approach Unity. By Professor EDWARD KASNER 524

A Mersenne Prime. By Mr. R. E. POWERS - - - 531

Osgood's Theory of Functions. By Professor E. B VAN VLECK - - - - - - - - - - 532

Notes - - - - - - - - - - - 546

New Publications - - - - - - - - - 550

Twenty-Third Annual List of Published Papers - - - 557

Index to Volume XX - - - - - - - - 565